State of Alaska
Department of Fish and Game
Habitat and Restoration Division

Nomination for Waters Important to Anadromous Fish

Region [▼] USGS Quad **Kenai C-1, D-1**

Anadromous Water Catalog Number of Waterway **247-60-10110-2080-3010-0010**

Name of Waterway Moose Lake ☑ USGS Name ☐ Local Name

☐ Addition ☐ Deletion ☐ Correction ☑ Backup Information

For Office Use

Nomination #	01 178		
Revision Year:	2001	Regional Supervisor	Date
Revision to:	Atlas ____ Catalog ____ Both N/A	[signature] AWC Project Biologist	7/13/01 Date
Revision Code:	F-1	Drafted	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Coho	9/4-5/1984		X		☑
Dolly Varden	9/4-5/1984			X	☐
					☐
					☐
					☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments:

Historic info on Moose Lake from historic USFWS sampling, see attached report excerpts.

Name of Observer (please print): USFWS Kenai Fisheries Research Staff

Signature: _____ Date: 7/10/01

Address: USFWS Kenai Fishery Resource Office

P.O. Box 1670, Kenai, AK 99611

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: _____

Revision 3/97

MOOSE LAKE

SURVEY PERIOD

Personnel of the U.S. Fish and Wildlife Service surveyed Moose Lake twice during 1984. J.W. Friedersdorff and A.S. Firman conducted a fishery survey on September 4-5. Additional water quality data were gathered by W.J. Jakubas and G.A. Muhlberg on July 18. Table 1 summarizes survey findings.

PHYSICAL FEATURES

Moose Lake is located in the northeast section of the Kenai National Wildlife Refuge (NWR) and is part of the Chickaloon River Basin. Its latitude is north 60° 44' and longitude west 150° 18'. The lake and surrounding area were designated as wilderness by the Alaska National Interest Lands Conservation Act of 1980. The watershed for the lake is estimated to be 3.3 square miles in area. Moose Lake has a surface area of 302 acres, a volume of 680 acre feet, and is at an elevation of 238 feet. The lake has a mean depth of 2.3 feet and maximum depth of 4.5 feet (Table 1 and Figure 1).

Moose Lake is situated in flat terrain with a gradual eastward slope toward Mystery Creek. Wetland bogs and muskeg surround most of the lake with a few small stands of black spruce and paper birch near the southwest and northern shores. Patches of dead spruce indicate the 1964 earthquake caused vertical land displacement which allowed water to saturate forested areas killing trees.

Lake water level is maintained by streams, springs, bog seepage, and run-off. Three seasonally intermittent inlet streams provide water to the lake. All had poorly defined channels, and none had detectable flow at the time of survey. A stream draining from Rabbit Foot Lake 1.5 miles to the southwest shore of Moose Lake had the most water; reflection of the water could be seen through dense vegetation the entire length between lakes. A second short inlet stream, originating from bog drainage, empties into the lake on the western side. Aerial photos indicate the third and longest inlet stream on the lake's northwest side has about a 2 mile drainage receiving water from two small lakes. It is possible the headwaters of this stream link with King Lake under high water conditions permitting temporary fish movement between the Chickaloon and Swanson River Basins.

The outlet stream, located on the south end of the lake, goes south then east about 1.5 miles before emptying into Mystery Creek. This stream was also swampy in character, had no well defined channel and no flow velocity. None of the streams, in the vicinity of the lake, exhibited visible rainbow trout or Dolly Varden spawning habitat.

Moose Lake is a remote lake. Overland hiking is the only means of access. Aircraft are restricted from landing on the lake by Refuge regulation.

FISH

Dolly Varden were found to be in moderate abundance with a catch per unit effort (CPUE) of 0.20 fish per net hour (Table 2). Intermediate size resident

Figure 1.

MOOSE LAKE

(302 Acres)

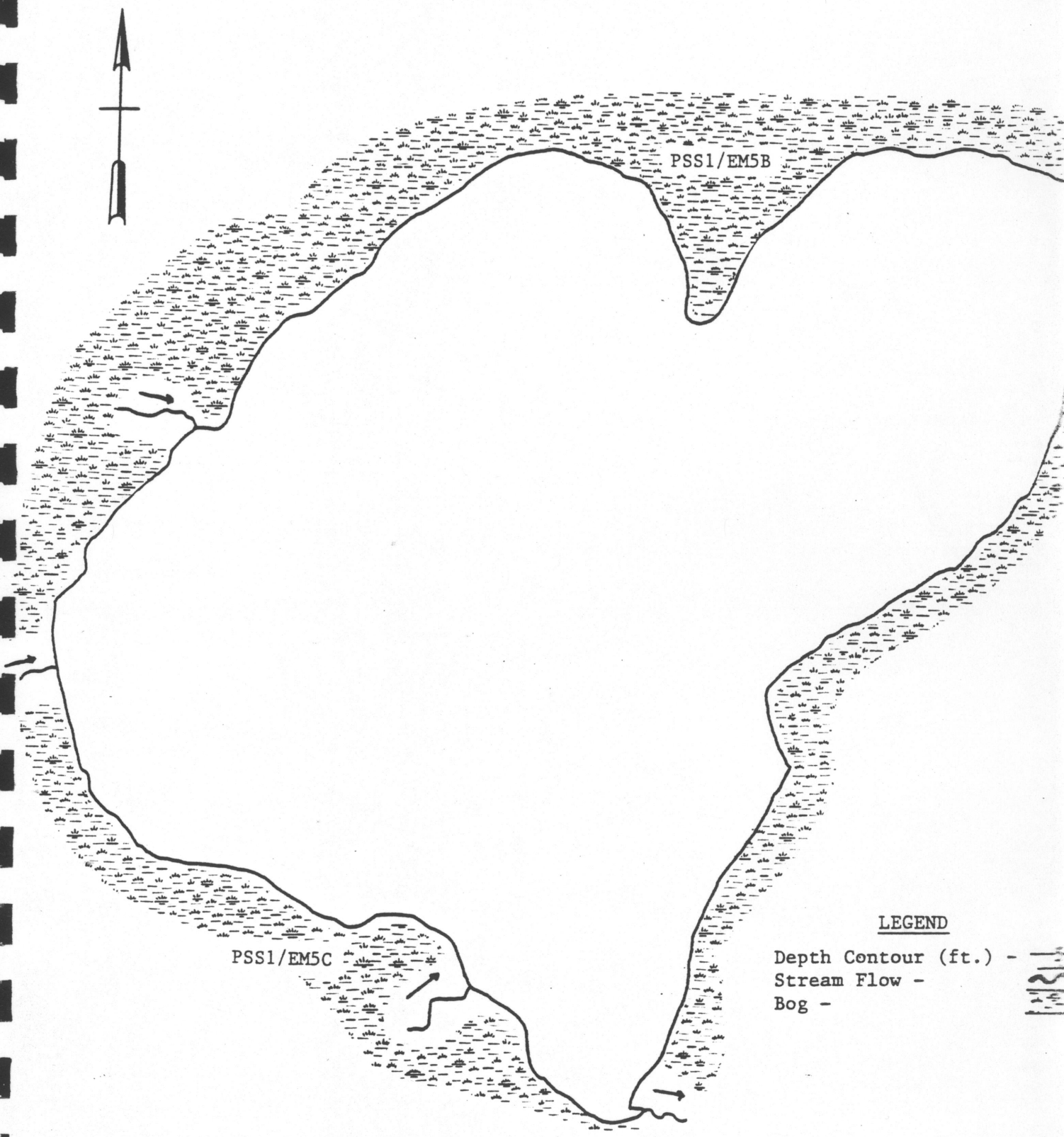

Table 2.

FISH CATCH AND EFFORT SUMMARY
Moose Lake 9/4-5/84

Gear	Average Fishing Time (hrs.)	Amount Gear (sq.ft.)	Fish Species	Total Fish Number	Sex M-F-U	Fish CPUE Net Hour	Fish CPUE Trap Hour
6 Gill Nets	17	4,800	Dolly Varden	20	8-6-6	0.20	N/A
			Coho Salmon	10	0-0-10	0.10	N/A
			All Species	30	8-6-16	0.30	N/A
20 Minnow Traps	24		Threespine Stickleback	4794	0-0-4794	N/A	9.99
			Coho Salmon	1	0-0-1	N/A	<0.01
			All Species	4795	0-0-4795	N/A	9.99

coho salmon, captured in gill nets, were low in abundance (CPUE 0.10). One small juvenile coho salmon was taken in a minnow trap; a large number of similar size coho juveniles were seen dimpling in the lake. Threespine stickleback were in high abundance at a CPUE of 9.99. Six gill nets and 20 minnow traps were used to measure fish abundance.

The Dolly Varden were of intermediate size ranging in fork length from 8.3 inches (210 mm) to 14.6 inches (370 mm), in weight from 0.2 pounds (105 g) to 1.3 pounds (580 g), and in condition from 1.04 to 1.31. Coho salmon had a complete fresh water life history with fork lengths from 9.1 inches (230 mm) to 11.2 (285 mm). Their weights were from 0.4 pounds (190 g) to 0.8 pounds (360 g). Condition factors ranged from 0.99 to 1.64. Scale analysis indicated all the intermediate size coho were two years old. Their growth rate was 3.6 inches per year. Summaries of length, weight, and condition for Dolly Varden and coho salmon are in Table 3.

AQUATIC VEGETATION

Aquatic plants were abundant covering most of the lake. Dominant species included yellow pond lily, star duckweed; the pondweeds, Potamogeton robbinsii, P. zosterifolius, and P. perfoliatus; and water milfoil. Marsh vegetation surrounded most of the lake. Scrub shrub wetland areas (types PSSI/EM5B and PSSI/EM5C) were plotted by the National Wetlands Inventory (USFWS 1978). Approximately 85 percent of the lake was covered with aquatic plants. A complete list of vegetation is in Table 4.

WATER QUALITY

The lake's alkalinity level of 45 mg/l was slightly greater than the average 39 mg/l found in the 37 lakes surveyed during 1983-84. This value is equivalent to the medium productivity level using our modification of Moyle's lake fertility classification (MacKenthun and Ingram 1967). A pH of 7.2 was near neutral. The shallow lake was uniform in temperature at 16.2°C during the July survey (Table 5). Corresponding dissolved oxygen values of 8.4 mg/l were equivalent to 85 percent saturation.

Water color was green brown and Secchi disc transparency was clear to the lake bottom. The lake had a Morphoedaphic Index of 137 and a Shoreline Development Factor of 1.29. Dissolved oxygen values found at the time of the fish survey are in Table 6.

MANAGEMENT HISTORY

No previous fishery investigations have been conducted on Moose Lake.

WILDLIFE

Several waterfowl species including Barrow's goldeneye, mallard, red-necked grebe, scaup, and white-winged scoter appeared to be gathering in flocks prior to fall migration. Common loons were present as well as a nesting pair of trumpeter swans with one signet. Beaver presence was verified by four active beaver lodges on the lake, and we saw one muskrat. Wildlife species along with other pertinent data are in Table 7.

Table 3. FISH LENGTH, WEIGHT, AND CONDITION SUMMARY
Moose Lake 9/4-5/84

Gear	Category	Species	Sample Size	Mean	Standard Deviation	Range
Gill Nets	Fork Length (mm)	Dolly Varden	16	307	44.7	210 - 370
		Coho Salmon	10	264	19.0	230 - 285
	Weight (g)	Dolly Varden	16	352	128	105 - 580
		Coho Salmon	10	266	55.4	190 - 360
	Condition (K)	Dolly Varden	16	1.17	0.10	1.04 - 1.31
		Coho Salmon	10	1.44	0.20	0.99 - 1.64

RECREATIONAL USE

There are no recreational uses ascribed to the lake due to its remoteness. The lake has no recreational use facilities.

FISHERY RESOURCE SUMMARY

Dolly Varden are the dominant game fish in the lake with a moderate CPUE of 0.20. A population of two year old coho salmon was also present (CPUE 0.10). In addition to the population of two year old coho, we saw a large number of juvenile coho dimpling in the lake; their identification was verified by the capture of one small coho in a minnow trap. A high population of threespine stickleback (CPUE 9.99) was the only forage species captured.

We do not believe the lake receives any sport fishing pressure. Lake fertility was medium with a MEI of 137. At the time of our investigation, fish migration through tributary streams appeared impossible due to low flow and channels being choked with vegetation. We believe the coho salmon migrated from Mystery Creek during high water. Similarly, the Dolly Varden probably came from Mystery Creek or migrated down stream from Rabbit Foot Lake.

Winterkill of the coho salmon and Dolly Varden may occur in certain years owing to the lake's shallow depth and low oxygen levels that would be caused by vegetation decay coupled with lack of air-water oxygen interchange. The function of Moose Lake as a coho salmon nursery area is not clear. The number of coho that utilize the lake and subsequently migrate down river to the ocean is unknown. Our survey indicated a large number of coho had become landlocked and/or lost their drive to outmigrate. During higher water conditions migration may be possible. The high abundance of threespine stickleback indicates they dominate the lake. Based on our findings the lake is accorded a negligible yield sport fish value. It's coho salmon nursery value, although unclear, is probably low in most years.